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CITES STEEL INDUSTRY PROGRESS IN 1949, JANUARY 1950; REVIEWS POSTWAR RECONSTRUCTION

(Numbers in parentheses refer to appended sources.)

That the USSR metallurgical industry made great strides in 1949 is evidenced by the fact that utilization of blast furnace capacity throughout the industry in 1949 was 18 percent higher than in 1940 and 6 percent higher than in 1948. The production of steel per square meter of open-hearth furnace sole increased 24 percent over 1940 and 11 percent over 1948. The industry developed in other ways during 1949. New processes in the production of pig iron and steel were put into practice, and new types of rolled products were produced for the first time. New methods of processing nonferrous metal ores were adopted to increase the recovery of metal. New types of hard and heat-resistant alloys and also alloys of nonferrous metals were put into production. Automatization of production processes is being adopted more widely. Particular success in this field has been achieved in the Magnitogorsk Metallurgical Combine, the Kuznetsk Combine, and the Novo-Tagil'skiy Plant. (1) In the fourth quarter 1949, the industry had exceeded the monthly level for rolled metal production of 1940. (2)

The 1950 prospect for production of pig iron in the USSR is 19.6 million tons, of steel 25.4 million tons, and of rolled metals 17.8 million tons. In 1950, output of equipment for the metallurgical industry will be 3.7 times the prewar level. In the years 1946 - 1950, the ferrous metallurgy industry will have gained 45 blast furnaces, 165 open-hearth furnaces, 15 converter furnaces, 90 electric furnaces, 104 rolling mills, and 63 coke batteries. (3) In 1949, production of metallurgical equipment in heavy-machine building enterprises was several times the 1940 level, and production of the more complex rolling equipment was on an even higher level. In 1950, metallurgical-machine building enterprises will produce, among other things, rolling mills for rolling petroleum-industry pipe, mills for rolling ball-bearing pipe, skelp-rolling, wheel-rolling, and other machinery. (4)

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Among individual plants supplying equipment to the metallurgical industry, the Dnepropetrovsk Metallurgical Equipment Plant has started production of all-welded 50-ton ladles for pig iron, the first of which have been sent to the Metallurgical Plant imeni Stalin in Stalino. (5) The Novo-Kramatorsk Machine-Building Plant imeni Stalin has completed production of a large-capacity electric-steel ladle crane which will be sent to the "Zaporozhstal'" Plant. (6) The Nevskiy Machine-Building Plant imeni Lenin, Leningrad, produces gas boosters for rail structural shops of metallurgical enterprises. The machine was designed by V. F. Ris, Laureate of the Stalin Prize. (7)

Scientific and engineering institutes continued their aid to the metallurgical industry during 1949. According to Academician I. Bardin, Vice-President of the Academy of Sciences USSR, the Academy, together with the Moscow "Serp i molot" Plant, has worked out methods for intensifying the open-hearth process and has successfully adopted these methods in production practice. The Academy has also developed methods for production of new heat-resistant alloys which have been given to the metallurgical industry. At present, the Academy is continuing its work on stepping up the open-hearth process and soon will considerably expand its research by working directly in plants in the Donbass, Siberia, and other regions. (8)

Among the important contributions made by higher educational institutions in recent years is that made by the Chair of Metallurgy of the Leningrad Polytechnical Institute, which under the direction of Academician M. A. Pavlov completed important research work on expanding the fuel base of the ferrous metallurgy industry. These specialists obtained a standard melt in a blast furnace by adding 15 percent of coke made from gas coal to the charge. This process has previously been considered unfeasible. (9)

In Leningrad, the spectroanalysis of metals is being introduced more extensively, with many new laboratories for this purpose opened in the city's enterprises. A regular seminar in spectroanalysis has been instituted in the Leningrad House of Technologists and is participated in by many workers from enterprises, scientific research institutes, and higher educational institutions. There is still a lack of analysts, but students in the senior courses at Leningrad University and the Institute of Precision Mechanics and Optics are being of great service to the Polytechnical Institute in this matter. For the future, it is planned to set up technical schools to train highly skilled laboratory workers and analysts for spectroanalysis. The success of the spectroanalysis method is shown by the fact that the Plant imeni Lepse has decreased the costs of analyzing pig iron by one third by using the method. (10)

At the Dnepropetrovsk Metallurgical Institute imeni Stalin, Aleksandr Chekmarev, known as the chief rolled-metal expert in the South, together with Docent M. M. Saf'yan, introduced a radical improvement in the methods of cold rolling of structural steel. Docent Andrey Krivosheyev and engineers of various metallurgical and roller-making plants developed a new type of roller with five times the durability of the usual type. These new rollers are now being used at the Dneprodzerzhinsk Plant imeni Dzerzhinskiy, the Nikopol' Southern Pipe Plant, the Magnitogorsk Combine, and the Stalingrad "Krasnyy Oktyabr'" Plant.

Z. I. Nekrasov, Laureate of the Stalin Prize, Ya. M. Obodan, and V. I. Listopadov, all scientific associates of the institute's Chair of the Metallurgy of Pig Iron, and F. S. Taranov, chief engineer at the Plant imeni Dzerzhinskiy, were the originators of a new method for regulating the operation of blast furnaces. The method is now being used at the Plant imeni Dzerzhinskiy, the Plant imeni Petrovskiy, at furnace No 1 of the Makeyevka Plant imeni Kirov, and most recently at the "Zaporozhstal'" Plant.

Workers of the institute's Chair of the Chemical Technology of Fuel have organized one of the best coke-testing stations in the USSR at the Dneprope trovsk Coke-Chemical Plant imeni Kalinin. The station is the center of the scientific research work of the institute and of the plant itself. The chair, headed by Prof A. S. Bruk, has developed an effective method of testing coke which is of extreme importance in providing standard operations of blast furnaces. (11)

Among achievements in the training of new metallurgical industry workers in 1949 was the completion in 9 months of last year of training in metallurgical enterprises by 30,000 new workers for the industry. Courses offering the technical minimum were taken by more than 42,000 persons, and 40,000 workers completed Stakhanovite schools. The USSR has set up 11 higher educational institutions which train personnel for the industry, 50 technical schools have been organized, and industrial institutes have opened metallurgical faculties. In fall 1949, 4,422 students entered schools for working youth in Sverdlovsk Oblast. (12)

Plans are under way for the further development of the Kazakh Mining and Metallurgical Institute (director, M. Grishin), by order of the Ministry of Higher Education USSR. The State Planning Commission, Academy of Sciences, and many ministries of the Kazakh SSR are working on the plans, with a view toward enabling the institute in a few years to graduate petroleum engineers, ferrous metallurgy specialists, geological prospectors in various fields, mine builders, and economists. In the 15 years since its founding, the institute has grown from an enrollment of 109 students and seven instructors to its present enrollment of 1,500 students and 100 instructors, including 12 professors and doctors of sciences and 35 docents and candidates in sciences. The institute has graduated more than 1,000 qualified engineers, the majority of whom are working in Kazakh enterprises. Last summer, the institute graduated 155 engineers. (13)

In 1949, individual metallurgical plants made significant achievements in production and technology. They continued their successes in January 1950. The Kazakh Metallurgical Plant, Temir-Tau, produced as much steel and rolled metal in 1949 as in the past few years taken together. In exchanging new methods with the Uzbek Metallurgical Plant, the Kazakh metallurgists have presented their innovations of an automatic tilt on roughing stands, an increase in the size of ladles so as to increase the weight of each melt, the use of a bottom plate holding 36 ingot molds instead of 32, and other important improvements. (14)

The Kuznetsk Metallurgical Combine, Kemerovo Oblast, has completed the January plan for the entire metallurgical cycle, exceeding the plan for mining iron ore and for coke production. Many tons of pig iron, steel, and rolled metal were produced above plan. Blast-furnace workers at furnace No 4 achieved a coefficient of 0.86 for capacity utilization of the furnace, as compared with the norm of 0.90. (15) At the beginning of January workers at furnace No 3 achieved a coefficient of 0.81, as compared with the norm of 0.90. (16) Workers at furnace No 1 are also achieving high production indexes. (17)

In Moscow, new technology is being widely adopted at the "Serp i molot" Plant. Every steelworker is using oxygen in speeding the smelting process, and open-hearth productivity has thereby increased considerably. One steelworker has reduced the time for smelting technically pure iron from 6-7 hours to 5 hours 5 minutes. (18) In open-hearth shop No 2, 3 hours 45 minutes is the norm for completion of a melt of manganese steel. One worker has beat the norm by 45 minutes. (19) The new record for high-speed melts in an open-hearth furnace is now 4 hours 10 minutes, as compared with the scheduled 6 hours 40 minutes. (20) Furnace No 4 in open-hearth shop No 1 was equipped this year with the new durable chromomagnesite roof, making it possible to conduct melts at a higher temperature. The steelworkers operating the furnace recently pledged to

increase the durability of the roof to withstand 350 melts between repairs. (21) The plant has exceeded its January plan for steel and rolled metal production. (20)

The Moscow Hard Alloys Combine (director, Blatov) had completed the Five-Year Plan for volume of production by the end of November. (22) A brigade at the combine has developed a new type of hydraulic press for use in the production of hard alloys. The new press is simpler than existing models, eliminating the defect of complex design and permitting faster repairs. (23)

At the beginning of 1949, the number of high-speed melts in Leningrad metallurgical shops was only 15-20 percent of the total, whereas at the beginning of January 1950 almost 50 percent of all melts are high-speed and some open-hearth furnaces are being operated on high-speed methods 80 percent of the time. (24)

In 1949, defective production at the Leningrad "Sevkabel'" Plant decreased from 0.29 percent (the 1948 figure) to 0.15 percent, and production costs decreased 48 percent from 1948. The plant also accomplished radical changes in cable production, working closely with the Leningrad Polytechnical Institute. Many new types of products were put into production as a result of cooperation with the Institute of Plastics.

In 1949, metallurgists of the Kirov Plant in Leningrad started production of new alloy steels and special rolled metal. (10)

On 26 January, the Metallurgical Plant imeni Dzerzhinskiy, Dneprodzerzhinsk, completed the Five-Year Plan for steel smelting in all operating open-hearth furnaces with a record high melt of 11.18 tons of steel per square meter of hearth instead of the planned 6.3 tons. Using the same equipment as before the war, steelworkers are now producing twice as much steel. The furnaces have been made automatic and have been equipped with chromomagnesite roofs; both of these measures have helped to increase production. (25)

The plant has adopted high-speed methods in the operation of each open-hearth furnace and in each shift. (26) Furnace No 8 in open-hearth shop No 2 has been the testing place for all new methods developed by the plant's engineers and workers. It was the first furnace in the South to have a chromomagnesite roof. Pavel Kochetkov, well-known Stakhanovite, was one of the leading figures in adopting the innovation, helping to overcome such installation difficulties as the recrystallization of the brick which made it impossible at first to add the layer of chromomagnesite. Since then, this type of roof has been installed successfully in the plant's open-hearth shop No 1, in the Dnepropetrovsk Plant imeni Petrovskiy, and in other enterprises. The increase in steel production in shop No 1 is evidenced by the fact that the casting pit could not hold the increased volume, but this difficulty too has been overcome. In 1949, because of the new type of roof, shop No 1 increased steel output 15 percent.

Kochetkov's methods of high-speed steel smelting include reducing the amount of slag in the melt to as thin a layer as possible and speeding the melting process by reversing the position of the limestone and the iron scrap, i.e., by putting the scrap on top of the limestone. His method avoids the usual loss of one hour for heating the charge prior to pouring in the molten pig iron by adding the pig right after the furnace is charged. Kochetkov also cut in half the period for heating the melt by charging large batches of ore into the furnace in charge boxes instead of having the steelworkers shovel it in. Last year, Kochetkov was made a member of the Scientific Council of the Dnepropetrovsk Metallurgical Institute, by a decision of the Ministry of Higher Education USSR, on the basis of a report to the Council of high-speed steel-smelting methods in which he proposed to double the production of steel per square meter of furnace hearth and to lengthen the run of the furnace to 1,000 melts between repairs. (27)

For several days in mid-January, Kochetkov obtained a daily average of 8.12 tons of steel per square meter of furnace hearth. He has also increased the durability of the basic roof to withstand 557 melts between repairs, almost three times the usual durability. (28) Another steelworker in Shop No 2 recently completed a melt in 5 hours 20 minutes, obtaining 9.64 tons of steel per square meter of hearth, as compared with the norm of 7.85 tons. (26) These new records mark the beginning of a new competition for mass high-speed melts in 1950 at the plant. (29)

The Plant imeni Dzerzhinskiy has also increased the volume of pig-iron smelting despite wintertime conditions. The high productivity of its blast-furnace shop was the result of using graded coke in the charge. The first 5-day period in January was ended with a coefficient of 0.82, as compared with the planned 0.84, for capacity utilization of the furnace. One shift, operating furnace No 1, obtained one ton of coke per 0.54 cubic meter of furnace capacity, a record which only recently was topped by one brigade's achievement of 2 tons per cubic meter, i.e., a coefficient of 0.50. (30)

At the Dnepropetrovsk Plant imeni Petrovskiy in mid-January, a steel-worker in open-hearth shop No 1 obtained 5.7 tons of steel per square meter of furnace hearth, as compared with the norm of 3.5 tons. (31)

The old blast furnace shops in both the Stalino and Yenakiyevo metallurgical plants are now averaging one ton of pig iron per 0.97 cubic meter of furnace capacity. When compared with the average coefficients of 1.11 and 1.081 in the newer and more modern blast-furnace shops of the "Azovstal'" and "Zaporozhstal'" plants, the achievement is even more notable. (32)

Blast-furnace workers in the Yenakiyevo Plant have pledged to bring the coefficient for capacity utilization of the blast furnace to 0.95 by 12 March and to smelt at least 1,000 tons of pig iron above plan for the first quarter. (33)

The "Zaporozhstal'" Plant has exceeded the prewar production level for steel, pig iron, and rolled metal. In only one year (1949) the plant increased pig iron production 59.7 percent, steel 170 percent, and rolled metal 45.2 percent. Among the improvements in technology planned for 1950 are: increase in the durability of open-hearth furnace roofs; the use of oxygen in the open-hearth process; further automatization of the operation of blast furnaces; conversion of major shops into high-speed shops. (34)

The pipe-rolling plant in Zhdanov, Stalino Oblast, had completed the Five-Year Plan for gross production and for quantity of pipe production by 26 January (35)

In its fourth-quarter-1949 competition with the Kuznetsk Combine, the Magnitogorsk Metallurgical Combine imeni Stalin came out the winner. In 1949, the combine produced more steel and rolled metal than had been planned for 1950. Both combines exceeded the fourth-quarter plan for mining iron ore, production of coke, pig iron, steel, and rolled metal. (36) The Magnitogorsk Combine has received new equipment which it is installing in its machine shop, including high-frequency generators for heat treatment of parts, new machine tools, bracket cranes, and electric shop trucks. (37)

This year, the production of steel in the open-hearth furnaces at the Zlatoust Plant, Chelyabinsk Oblast, has increased by more than one ton per square meter of furnace hearth, so that the production per square meter has now become 7 to 8 or more tons. (38)

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The Novo-Tagil'skiy Metallurgical Plant, Sverdlovsk Oblast, has just completed its first order for beams for use in the construction of Moscow's high buildings. (39) The record for high-speed melts at the plant now stands at 7 hours for a heavy melt, as compared with 9½ hours called for by the norm. The steel production per square meter of furnace hearth was 12.65 tons for this melt, almost double the progressive norm. (15) In the first 4 days of January, workers in the plant's blast-furnace shop smelted one ton of pig iron per .82 cubic meter of furnace capacity. This is higher than any coefficient achieved in the best summer or fall months. (40)

With the beginning of the new year, the following chronological review of postwar achievements in reconstruction and construction of metallurgical enterprises was drawn up:

1946

18 September -- Blast furnace No 4, largest in the South, of the "Azovstal'" Plant restored

October -- Construction completed on Uzbek Metallurgical Plant

November -- Blast furnace No 1 of the Kuznetsk Metallurgical Combine reconstructed in 75 days

30 December -- New blast furnace blown in at the Alapayevsk Plant in Sverdlovsk Oblast

31 December -- Blooming mill restored and put into operation at the Makeyevka Plant imeni S. M. Kirov

As a whole, in 10 months of 1946 five blast furnaces, ten open hearths, seven rolling mills, seven coke batteries, and eight iron mines were restored and put into operation, and the Volkhovo Aluminum Plant was restored and started operations.

1947

29 June -- Blast furnace at "Zaporozhstal'" and blast furnace No 2 at the Lipetsk Plant blown in

30 June -- Blast furnace No 3 at "Zaporozhstal'" produced its first pig iron

3 October -- Reconstruction of the first section of "Zaporozhstal'" completed and production begun of cold-rolled steel sheet

October -- "Bol'shoy shtifel'" pipe-rolling mill at the Nikopol' Southern Pipe Plant put into operation

November -- Shop for production of seamless rolled wheels for railroad transport put into operation at Dnepropetrovsk Plant imeni K. Libknekht

1948

April -- First open-hearth furnace at "Zaporozhstal'" put into operation

May -- Second open-hearth furnace completed at "Zaporozhstal'"

June -- New open-hearth furnace put into operation at Dnepropetrovsk Metallurgical Plant imeni Petrovskiy

July -- New all-welded blast furnace put into operation at "Zaporozhstal'"

July -- Pipe-rolling shop of the Dnepropetrovsk Plant imeni K. Libknekht put into operation. (41)

In August 1948, it was reported that two blast furnaces and five open-hearth furnaces had been rebuilt at "Azovstal'," a new blooming mill constructed, and a rail mill installed. (42)

1949

January -- Another large blast furnace put into operation at the Voroshilovsk Plant imeni Voroshilov (41)

The following Ukrainian enterprises of the metallurgical industry were reported restored after 1944:

Four coke batteries and chemical shops at the Rutchenkovo Coke-Chemical Plant

First section of the Chasov-Yar Refractories Plant imeni Ordzhonikidze, Stalino Oblast

Krasnogorovka Refractories Plant, Stalino Oblast

Blast furnace No 1 at Konstantinovka Plant imeni Frunze

First coke battery at Novo-Makeyevka Coke-Chemical Plant. (43)

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34. Pravda Ukrainy, No 6, 7 Jan 50
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39. Leningradskaya Pravda, No 7, 8 Jan 50
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